eight skeletal sites and knee structure in asymptomatic young to middle-aged females without any clinical signs of osteoarthritis.
Methods: One hundred and sixty healthy, females (29–50yr) without symptoms of osteoarthritis underwent magnetic resonance imaging of the knee. BMD was measured at the spine, hip, total body and forearm by dual energy x-ray absorptiometry, and SoS, BUA and SI were measured at the calcaneus by quantitative ultrasound (QUS). BMD and QUS measures were tested for an association with cartilage volume, defects, and bone marrow lesions (BMLs).
Results: medial cartilage volume was positively associated with bmd at the total body, femoral neck, and ward's triangle (all $p < 0.05$). Non-significant associations in the same direction existed at the spine ($p = 0.07$), and trochanter ($p = 0.10$). Findings in the lateral compartment were similar. The presence of medial cartilage defects showed a non-significant association with bmd at the spine ($p = 0.05$). Bmd was not associated with lateral cartilage defects or bmls. No associations were observed with qus measures at the calcaneus.
Conclusions: Whilst site-specific BMD is associated with cartilage volume at the knee in asymptomatic females aged 29–50yr, peripheral BMD measures, and QUS measures of the calcaneus, showed no associations with knee structure. These data suggest that the association between cartilage volume and axial/ lower limb BMD may relate to common local, possibly biomechanical, factors.

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COMPARISON OF TWO HYALURONIC ACID FORMULATIONS ON FUNCTIONAL OUTCOMES IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Purpose: Intra-articular hyaluronic acid (HA) injections are a non-surgical palliative treatment for knee osteoarthritis (OA) that have the potential to reduce pain and improve functional ability. However, not all patients that receive HA injections have a beneficial response. Several different HA formulations are available and a comparative analysis of outcomes is lacking in the literature. The purpose of this study was to quantify the functional benefit of two different HA formulations for individuals with knee OA.
Methods: The Knee Outcome Survey (KOS) of 378 patients who received HA injections for knee OA were retrospectively analyzed. Baseline scores prior to injection and scores 4–6 weeks after the first injection were compared between subjects who received 4 Supartz injections ($n = 220$) or a single Synvisc-One injection ($n = 158$). Responders to the HA injections were operationally defined by two methods: 1) individuals who had a KOS change score greater than 11 points, the minimally detectable difference for the KOS, or 2) patients who showed any magnitude increase in KOS scores. Self-reported knee function, ranked as "Severely Abnormal", "Abnormal", or "Nearly Normal", was evaluated at baseline. Change in pain (0–5 scale) was compared between injection types and between groups created based on the self-reported knee function at baseline. A repeated measures ANOVA was used to assess change in KOS score between injection types. Chi-square analysis was used to determine differences in the responder rate between injection types and determine if there was a relationship between change in pain and injection type or between change in pain and baseline self-reported knee function.
Results: There was a significant improvement of 5.77 (SD 13.83) points in KOS scores between baseline and follow-up ($p < 0.001$), although no difference was found in KOS change scores between Supartz or Synvisc-One HA injections ($p = 0.95$). 45% of individuals reported decreased pain at follow-up ($p < 0.001$), with no difference between injection types ($p = 0.23$). The ratio of responders to non-responders was 28/72 based on the 11 point KOS change criterion and 66/34 based on any change in KOS criterion. There was no difference in response rate between Supartz and Synvisc-One based on the 11-point change ($p = 0.73$) or any change ($p = 0.83$) in KOS scores. At baseline, 18, 122, and 237 patients classified their knee function as Severely Abnormal, Abnormal, or Nearly Normal, respectively. There was a significant relationship between baseline self-reported functional score and change in KOS score ($p < 0.001$) (Figure 1) and responder rate using the 11 point change in KOS score criterion ($p < 0.001$), with lower functional report at baseline corresponding to an increased likelihood of improvement at follow-up. The relationship between baseline self-reported functional score was not significantly related to the change in pain ($p = 0.07$) or responder rate using any change in KOS score criterion ($p = 0.21$).

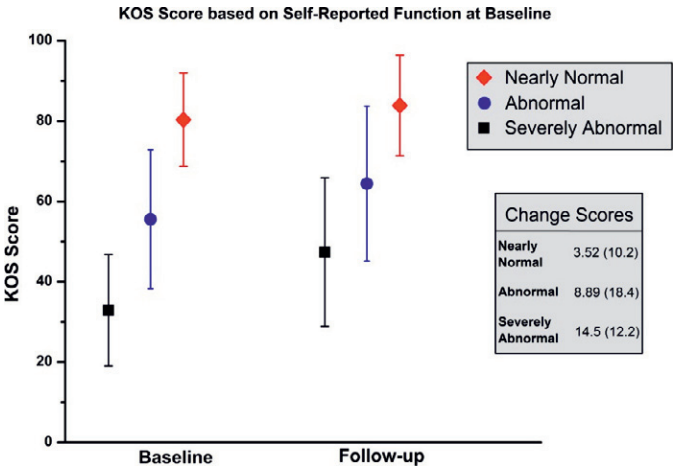

Fig. 1.

Conclusions: Both HA formulations resulted in significant, but relatively small, improvements in KOS scores and pain. Patients who report their knee function as worse at baseline have the greatest likelihood of larger improvements in KOS scores and a tendency for greater reduction in pain. This trend may be a characteristic of the ceiling effect in the metrics used to analyze post-injection outcomes and future work should assess other variables that may provide information on which subsets of patients will have an optimal response. HA injections provide pain relief and reduce disability in nearly 2/3 of patients and there was no apparent functional benefit to the single versus multi-dose regimens. Patients with a wide degree of disability at baseline benefit from HA injections, but patients who are more disabled may experience a greater functional improvement with this treatment. Funding for this study was provided by NIH grant P20RR01645

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CORRELATION BETWEEN RADIOGRAPHIC FINDINGS, SF-36 AND WOMAC SCORES FOR EVALUATION OF KNEE OSTEOARTHRITIS

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Purpose: Criteria that define disease severity in osteoarthritis (OA) are essential for diagnosis and the evaluation of different treatment interventions. At present, these evaluations rely mostly on radiographic evaluation and subjective self-reported surveys. The validity of these clinical tools, however, is loose. The purpose of the current study was to evaluate the correlations between common clinical OA diagnostic tools in order to determine the value of each. A secondary goal was to investigate the influence of gender differences on the findings.
Methods: 518 patients with medial compartment knee OA were evaluated using the Western Ontario and McMaster Osteoarthritis Index (WOMAC) questionnaire, SF-36 Health Survey and plain radiographs. A correlation analysis was performed between the different domains of each and the radiographic scale.
Results: A significant correlation was found between WOMAC pain, stiffness and function scores and all SF-36 domains. Functional and physical items were better correlated than mental, emotional and stiffness items. In addition, significant gender differences were found in all domains tested. Poor correlations were found between the radiographic severity of the disease and the domains of the clinical surveys.
Conclusions: Radiographs are unreliable in determining symptomatic severity of disease in knee OA, as they correlate poorly with pain and function. While all domains of the SF-36 and WOMAC questionnaires are correlated, functional and physical items of the questionnaires are in greatest agreement. This may suggest that these domains provide the most superior assessment of symptomatic knee OA.